

YIELD EFFECTS OF HYDRA-HUME, TRAFIX ES CAL EIGHT, AND QHP ON CANTALOUPE

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Introduction

Humus is the organic component of soil that resists further decomposition. It results from the break down of organic material such as dead roots and other plant residues. Cultural practices that attempt to increase soil organic matter, such as conservation tillage and manure applications, all aim at eventually increasing the level of humus within a particular soil so that productivity can be maximized. Soluble humus present within a soil increases cation exchange capacity (CEC), water holding capacity, and tilth.

Humus is generally classified into three groups based on molecular weights. Humin is high in molecular weight, but insoluble in both acids and bases. Soluble humus includes both humic and fulvic fractions. Humus molecules that are moderate in weight (7000-700,000 Daltons) are humic acids. Humic acids are moderately dark brown in color and soluble in bases. Molecules that are low in molecular weight (700-7,000 Daltons) are referred to as fulvic acids. Fulvic acids are light yellow in color and soluble in acids and bases.

Horizon Ag-Products specializes in the manufacture and formulation of soluble humus products. Previous research has demonstrated that these products are capable of stimulating plant growth and yield in other regions but little information is available from the Southeast. In this experiment, several soluble humus products were applied alone and in combination to cantaloupe plots located within a commercial field near Tifton, Georgia. The yield and tissue responses were observed.

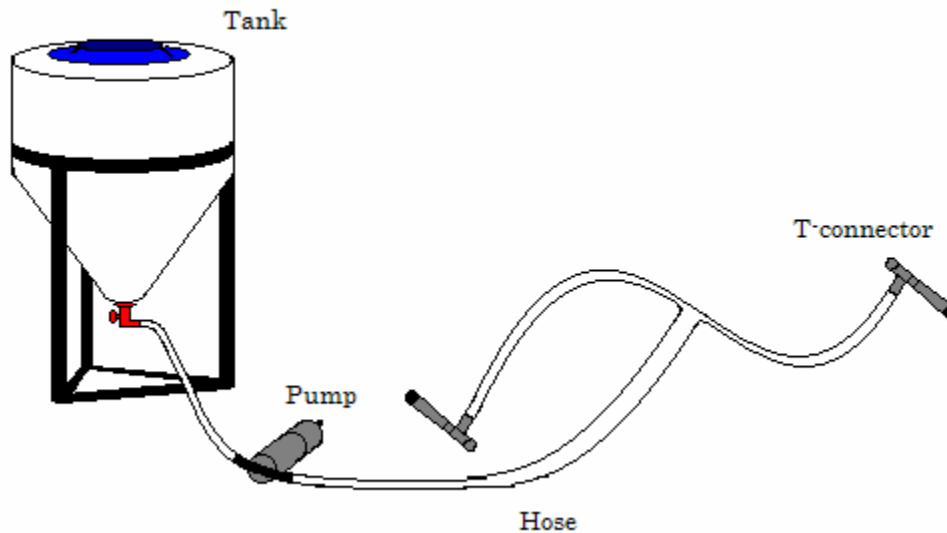
Materials and Methods

Products tested in this experiment were Hydra-Hume (Horizon Ag-Products), Hydra-Hume DG (Horizon Ag-Products), TraFix Es CAL Eight (Horizon Ag-Products), and QHP (Horizon Ag-Products). Hydra-Hume is a 0-0-1 fertilizer that contains high (12%) levels of humic acids in liquid formulation. Hydra Hume DG contains 70% humic acids in dry granular formulation. TraFix Es CAL Eight is a low pH fertilizer containing

5% nitrogen and 8% calcium as well as fulvic acids. QHP is a new product containing both humic and fulvic acids as well as other organic components.

Products were injected through the field's drip irrigation system. The injection equipment (Figure 1) consisted of a 12 gallon cone tank, small injection pump, and a network of hoses. T-connectors were attached to the end of each hose which were attached to individual drip tape lines in the field in order to enable injection to take place. Injected products were mixed in the tank separately with 6 gallons of water per injection over approximately a ten-minute period. After injection, water was allowed to continue to be pumped through the drip tape in order to allow the injected products to be flushed from the lines and into the test area.

Figure 1



Cantaloupes (Athena variety) were grown in a plasticulture production system. Plants were established in a commercial greenhouse and transplanted to the field March 11 in 6 feet row spacing and 18 inches in-row plant spacing. Pre-plant fertility included broadcast applications of 5-10-15 fertilizer (1000 lb/A), dolomitic limestone (1 ton/A), and gypsum (0.5 ton/A). Also, 20-20-20 fertilizer (5 lb/A) was foliar applied at first harvest (June 8) and two weeks following first harvest (June 22). Plot fertility also included 7-0-7 fertilizer (100 gal/A) and calcium nitrate (50 gal/A), each injected in small amounts throughout the growing season to total the given rates. Standard management practices for pest management and irrigation were followed by the grower.

Experimental plots were laid out in a Randomized Complete Block design consisting of 11 treatments, each replicated four times. Hydra-Hume, Hydra Hume DG, TraFix Es CAL Eight, and QHP were applied alone and in combination at various rates and timing as shown in Table 1.

Results and Discussion

In this experiment data collection of exact yields proved infeasible. This was due to frequent (almost daily) commercial harvesting. As an alternative, a yield estimation method was used. Data from each treated plot was collected weekly on three dates (June

6, June 13, and June 21). Beginning at first harvest (June 6), all cantaloupes showing any signs of netting were counted within each plot. Because previous research has indicated that cantaloupes reach marketability approximately 1 week after first netting, counting netted melons once per week provided a reliable estimation of yield. In addition, all marketable cantaloupes were counted and weighed once each week for every plot in order to calculate average fruit weight.

A penetrometer was used to measure fruit firmness. Measurements were collected on the June 13 harvest. Two readings per cantaloupe were taken from two harvested cantaloupes in each experimental plot. All collections of data were analyzed electronically by the SAS system, and subjected to the analysis of variance (ANOVA) procedure. Results on average number of netted cantaloupes, average fruit weight, and penetrometer readings for each treatment are summarized in Tables 2 and 3.

Several determinations are made clear from the tables below. The number of cantaloupes from treatment 3 (Hydra-Hume, 1 gal/A injected at transplant) was significantly higher than all other treatments except treatment 4 (Hydra-Hume, 3 gal/A season long beginning at transplant) and treatment 7 (Hydra-Hume, injected at transplant; plus Es CAL Eight, injected every 3 weeks beginning 1 week before flowering). Treatment 3 (Hydra-Hume, injected at transplant) was the only treatment with a significantly higher marketable weight yield than the untreated control. Also, treatment 8 (QHP, injected every 4 weeks beginning at first flower) was found to have higher fruit weight than did treatment 2 (Hydra-Hume DG, pre-plant broadcast). Finally, penetrometer results revealed no statistical difference in fruit firmness between the treated and untreated plots in this experiment.

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Table 1. Hydra-Hume, Es CAL Eight, and QHP treatments on experimental plots within a Tifton, GA commercial watermelon field.

Treatment and Description	Rate	Method	Date(s) Injected		
1 Untreated					
2 Hydra-Hume DG	40 lb/ac	Pre-plant broadcast	3/15		
3 Hydra-Hume	1 gal/ac	Inject at transplant	3/15		
4 Hydra-Hume	1 gal/ac/app	Inject at transplant - 3 gal. season long (spoon feed)	3/15	5/10	6/14
5 Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
6 Hydra-Hume DG	40 lb/ac	Pre-plant broadcast	3/15		
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
7 Hydra-Hume	1 gal/ac	Inject at transplant	3/15		
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
8 QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
9 QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
10 Hydra-Hume	1 gal/ac	Inject at transplant	3/15		
QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30
11 Hydra-Hume DG	40 lb/ac	Pre-plant broadcast	3/15		
QHP	1.5 lb/ac/app	Inject every 4 weeks beginning at first flower		5/10	6/14
Es CAL Eight	1 gal/ac/app	Inject every 3 weeks beginning 1 week before flowering		5/10	5/30

Table 2. Cumulative total mean number of netted melons counted by date of cantaloupes treated with various rates and timings of soil amendments at Tifton, Georgia in 2005.

Treatment	Netted Cantaloupes (No.)		
	6-Jun	13-Jun	21-Jun
01	35.0 AB	65.8 A	73.5 A
02	34.3 AB	66.0 A	71.0 A
03	36.0 A	69.8 A	76.5 A
04	34.3 AB	66.3 A	72.8 A
05	34.8 AB	67.3 A	75.5 A
06	33.0 AB	65.5 A	73.3 A
07	31.0 AB	61.8 A	66.8 A
08	31.3 AB	61.5 A	71.8 A
09	35.0 AB	64.8 A	71.5 A
10	29.8 B	59.5 A	65.8 A
11	33.0 AB	62.0 A	67.5 A
Mean of Test	33.4	64.5	71.4
L.S.D. (0.05)	6.2	11.3	11.4
C.V. (%)	12.9	12.1	11.0

*Means within a column followed by different letters were significantly different (P=0.05, LSD, ANOVA).

Table 3.

Total marketable weight, average fruit weight, and penetrometer readings of cantaloupes treated with various rates and timings of soil amendments at Tifton, Georgia in 2005.

Treatment	Marketable Weight		Fruit Weight	Penetrometer
	(lbs)	(lbs/A)	(lbs)	(psi)
01	32.6 B	28,136	4.4 AB	9.3 AB
02	29.0 B	25,326	4.1 B	11.3 A
03	50.9 A	30,615	4.6 AB	9.6 AB
04	37.1 AB	26,601	4.2 AB	9.1 AB
05	22.3 B	28,901	4.4 AB	10.2 AB
06	23.0 B	26,784	4.2 AB	8.6 B
07	35.6 AB	24,990	4.3 AB	10.3 AB
08	21.5 B	29,359	4.7 A	8.6 B
09	28.4 B	26,126	4.2 AB	9.3 AB
10	26.9 B	26,333	4.6 AB	9.6 AB
11	30.0 B	26,426	4.5 AB	9.5 AB
Mean of Test	30.6	27,332	4.4	9.6
L.S.D. (0.05)	16.4		0.6	2.3
C.V. (%)	37.2		9.4	16.6

*Means within a column followed by different letters were significantly different (P=0.05, LSD, ANOVA).